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Manganese Staining of Medieval Bone from Hulton Abbey

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Introduction

The site of the Medieval Cistercian Abbey was excavated by The Potteries Museum & Art Gallery's Archaeology Unit between 1987 and 1994 (Monument number 35857). The Abbey was founded by Henry De Audley in 1219. Following the dissolution (1538), the site was lost until 1884.

The abbey was part of a Cistercian Order; income was received for wool produced from sheep kept on the land around Hulton. By 1291 a tannery, watermill and fishpond could also be found on and around the monastery. The remains of 91 individuals were recovered from medieval deposits at Hulton Abbey. The burials took place over a 300 year period and a number of graves were disturbed by overlying or adjacent interments. From a total of 70 individuals excavated during the 1987-1994 excavation, fifty seven were adult and thirteen were immature (20 years or less).

Many of the skeletons excavated (which were of 'high-status' individuals), demonstrated a dark staining which was intermittent across the skeletal remains. Some skeletons did not demonstrate this staining and there appears to be no correlation between the staining and the location of the grave within the abbey building.



Materials and Methods

Some skeletal material has been examined using qualitative X-ray microanalysis in the scanning electron microscope. These samples have demonstrated the presence of manganese and iron. A possible explanation for the presence of manganese may be the tannery or indeed other small industries that were present in the abbey environment. ICP analyses carried out as part of the 1987-1994 excavation did show the presence of MnO in the clay ranging from 0.04-0.13µg/g of the element. Manganese concentrations of the soil samples examined from the graves ranged from 0.94µg/mL to 175µg/mL.



Conclusion

Despite some discussion in the literature concerning black staining attributable to manganese, little is known about this taphonomic process. The origin of manganese coatings may be the result of diverse species of manganese-oxidising bacteria. Further analysis looking at the concentrations of manganese, lead, and iron in the soil may reveal more discrimination between the black and white bone graves if it is an interaction between these leading to the staining.



Hulton Abbey

